

Notice of Allowability

Application No.

10/715,359

Examiner

Tom P. Duong

Applicant(s)

RAULEDER ET AL.

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/19/03.
2. ☒ The allowed claim(s) is/are 19-30.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/749,520.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date 11/8/2006.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 11/19/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Stephen U. Koschmieder on November 6, 2006. Applicants agreed to submit formal drawings to reflect changes in the specification.

The application has been amended as follows:

In the specification:

Prior to the first paragraph of page 1 of the specification, insert the following paragraph: --This application is a division of U.S. Application No. 09/749,520 filed on December 28, 2000, now Patent No. 6,680,038.--

Please replace the paragraph beginning at page 10, line 21, with the following rewritten paragraph:

Figure 2 is a schematic diagram of an apparatus for carrying out the second embodiment of the process according to the present invention. At the mixing site [[11]] 21, the chlorosilane-containing gas stream [[12]] 22 is introduced into the tubular reactor [[13]] 23, whose inner walls are wetted with "another aqueous liquid" [[22]] 32, such as

tap water or deionized water. The walls of the tubular reactor 23 are cooled by the cooling agent 24. Upon entry into the tubular reactor 23, the velocity of the gas stream 22 decreases greatly. The treatment of the gas stream 22 with the steam originating from the other aqueous liquid 32 takes place in the tubular reactor 23, with formation of hydrogen chloride and primary hydrolysis products. The formation of secondary hydrolysis products takes place in the other aqueous liquid 32 which wets the wall of the equipment, resulting in a suspension. This suspension is separated from the purified gas stream 26 in the collecting container 25 and removed continuously or periodically as a hydrolyzate suspension 15. The purified gas stream 26 then passes through the scrubber 27 which can be charged, for example with water, and leaves the system as waste gas 28. Scrubber 27 may also be used for monitoring the content of residual silicon-containing compounds in the gas stream. To re-use the other aqueous liquid 32, the suspension can be recycled as a stream 29 until the concentration of the secondary hydrolysis products has reached a predetermined value. In addition, the circulation stream 29 can be treated to neutralize the hydrogen chloride formed by the hydrolysis of chlorosilanes with an aqueous alkaline liquid 31, which can be removed, for example, from the reservoir 30. If the other aqueous liquid 32 or the circulation stream 29 is rendered alkaline in this manner, largely soluble silicon compounds result, thereby markedly reducing the tendency for deposits to form on tubular reactor 23 and collecting container 25.

Please replace the paragraph beginning at page 12, line 15, with the following rewritten paragraph:

Figure 3 is a schematic diagram of an apparatus for carrying out the third embodiment of the process of the present invention. At the mixing site 41, the chlorosilane-containing gas stream 42 and steam 43 are introduced into the tubular reactor 44, where the treatment of the chlorosilane-containing gas stream 42 with steam 43 takes place with formation of primary hydrolysis products. The tubular reactor 44 dips into the cooling container 45, whose inner walls are wetted with the "other aqueous liquid" 54. In addition, the walls of tubular reactor 44 can be cooled by means of a cooling agent 46. The flow rate of gas streams 42 and 43 greatly decreases upon entry into the cooling container 45. Steam 43 condenses in the interior of the cooling container 45, and the condensate is transported to the wetted equipment wall together with secondary hydrolysis products by means of a Stefan flow. The resulting suspension of secondary hydrolysis products, condensed steam 43 and other aqueous liquid 54 runs off the walls, is collected in the collecting container 47 and removed continuously or periodically. The purified residual gas 48 then passes through the scrubber 49, which may be charged, for example, with water, and leaves the system as waste gas 50. In addition, scrubber 49 may be used to ~~monitoring~~ monitor the residual content of silicon-containing compounds in the gas stream. In the third embodiment of the process of the present invention, it is generally not necessary to remove hydrogen chloride from the waste gas 50. In order to

minimize use of the "other aqueous liquid" [[44]] 54, the suspension may be recycled as stream [[41]] 51 until the concentration of the secondary hydrolysis products has reached a predetermined value. In addition, the circulation stream [[41]] 51 may be treated with an aqueous alkaline liquid [[43]] 53, for example, from the reservoir [[42]] 52, to neutralize the hydrogen chloride formed by hydrolysis of chlorosilanes. If the "other aqueous liquid" [[44]] 54 or the circulation stream [[41]] 51 is rendered alkaline in this manner, largely soluble silicon compounds result, thereby markedly reducing the tendency deposits to form on cooling containers [[35]] 45 and collecting container [[37]] 47.

The following is an examiner's statement of reasons for allowance:

The prior art fails to disclose or suggest "an apparatus for removing a chlorosilane from a gas stream comprising: a vertically oriented tubular reactor connected to a stream of steam and said gas stream, a cooling container having a cooling jacket or cooling coil and provided with a drain for removing condensed liquids, and a gas scrubber containing a solution capable of absorbing HCl, wherein said tubular reactor extends into the interior of said cooling container so that said gas stream and said steam stream mix and flow through said tubular reactor into said cooling container, and said gas scrubber is connected to said cooling container so that uncondensed gases from said cooling container flow through said gas scrubber".

.Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

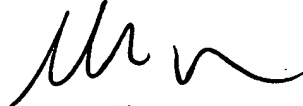
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Duong
November 8, 2006

TD


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